ACCESSION #: 9612170377

LICENSEE EVENT REPORT (LER)

FACILITY NAME: MONTICELLO NUCLEAR GENERATING PLANT PAGE: 1 OF 6

DOCKET NUMBER: 05000263

TITLE: Jumper Placement Error During Surveillance Procedure

Causes Dual Recirc Pump Trip, Requiring a Manual Scram

EVENT DATE: 11/12/96 LER #: 96-011-00 REPORT DATE: 12/12/96

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: Tom Parker TELEPHONE: (612) 295-1014

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

During a new surveillance procedure, a jumper was installed on the wrong relay. This caused the tripping of both reactor recirculation pumps. The operators inserted a manual reactor scram in accordance with abnormal operations procedures. The jumper was installed by a licensed operator and witnessed by the engineer who had written the test. The geometry of the relay location and inadequate labeling caused the wrong relay to be independently selected by the operator and the engineer. The surveillance procedure was revised to select a more accessible location for jumper installation. Labeling improvements will be made.

NOTE: This text document was processed from a scanned

Description

During a surveillance procedure, at 0930 on November 12, 1996, a jumper was placed on an incorrect relay causing the automatic tripping of both reactor recirculation pumps 1_/(EIIS System Code: AD) (EIIS Component Code: P). The plant was operating at 100% power prior to the event.

The surveillance (#1448) was a new procedure being performed for the first time. The procedure was written to address issues discussed in Generic Letter 96-01, Testing of Safety-Related Logic Circuitry. The jumper was landed by a licensed control room operator and witnessed by a system engineer. The engineer is responsible for Emergency Core Cooling System logic testing and had written the new procedure. The jumper actuated a relay (EIIS Component Code: RLY) in the Low Pressure Coolant Injection Loop Selection Logic (EIIS System Code: BM), which caused the

tripping of both reactor recirculation pumps. Plant procedures required the operators to insert a manual scram to prevent the occurrence of neutron flux oscillations in high power/low flow conditions. No neutron flux oscillations 2_/ occurred during the short time before the scram when the plant was in a high power/ low flow condition (48% reactor power and natural circulation).

Sequence of Events:

0930 Both reactor recirculation pumps trip (initial reactor power 100%)

0931 Manual reactor scram. Reactor power at the time of the scram = 48%

0932 Reactor water level decreases to 5" due to reduction in heat generation in the core and the associated collapsing of steam voids

0933 Reactor water level increases to normal level. #11 reactor feedwater pump trips on low flow (EIIS System Code: SJ) 0935 Water level continues to increase as the cooler feedwater is heated and expands, #12 reactor feedwater pump trips on high reactor water level

Cause

The relay to be jumpered is located in Panel C32 in the cable spreading room (see attached figure). Relays on C32 are mounted on the front vertical surface of the panel. Electrical

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1_/ The reactor recirculation pumps provide forced circulation in the reactor in combination with the jet umps. The reactor recirculation pumps are commonly referred to as the "recirc" pumps.

2_/ The Average Power Range Monitor peak to peak fluctuations were less than 0.3% following the tripping of both recirculation pumps.

connections are accessed through the back panel doors. The relays are all labeled on the front of the panel and some relays are labeled inside the panel. Neither the relay that was identified in the procedure nor the relay that was jumpered were labeled inside the panel.

The relay was correctly identified from the front of the panel as the fourth relay from the end of the panel. In order to apply the jumpers, the personnel needed to go inside the panel from the back and locate the fourth relay from the end. They went to the first panel door from the end of the panel and found a structural member located next to the fourth relay, which would have made it difficult to install the jumper. They then went to the adjacent panel door and located what they thought was the same structural member and jumpered the relay next to it. Later investigation identified that there were two structural members and the fifth relay was actually jumpered. The licensed operator and the engineer independently selected the same wrong relay to jumper.

This procedure was performed in the morning of a normal work day. The

personnel involved were not under any time constraints to complete this procedure. Adequate lighting was available.

The cause of the #11 reactor feedwater pump trip was believed to be the minimum flow controller (EIIS Component Code: TC) response time. When the pump flow decreases, the system is designed to open a minimum flow valve to the main condenser to maintain flow through the pump when the feedwater regulating valves are closed. If the flow is below a preset flow for 1 0 seconds, the logic will trip the reactor feedwater pump.

The controller did not open the minimum flow valve fast enough to maintain flow above the preset flow and #11 reactor feedwater pump tripped. The #12 reactor feedwater pump's minimum control valve responded adequately and has a 15 second (rather than a 10 second) delay to the low flow trip. Therefore, #12 reactor feedwater pump did not trip at this time.

The later tripping of #12 reactor feedwater pump on high reactor water level was a normal function upon reaching high water level.

During a subsequent outage on December 7, 1996, the zero on the #11 minimum flow valve positioner was found to have shifted. This contributed to the minimum flow controller response problem.

Analysis of Reportability

This event is reportable per 10 CFR Part 50, Section 50.73(a)(2)(iv) since this event resulted in an unplanned manual actuation of the reactor protection system. The tripping of the reactor

recirculation pumps was part of the Emergency Core Cooling System (ECCS) initiation. Considering this a false ECCS actuation would provide another reason to report this event.

Safety Significance

This event challenged the reactor protection system and part of the ECCS system. The part of the ECCS system that was actuated performed properly. The reactor protection system properly shutdown the reactor and all safety systems performed properly.

The tripping of the #11 reactor feedwater pump occurred when reactor water level was restored and the pump was not needed, i.e., at low flow conditions. The #12 reactor feedwater pump tripped on high reactor water level. This is a normal response to high water level conditions. These pump trips are non-safety related, and the tripping occurred at conditions when the pumps were not needed. Neither trip prevented the pumps from being restarted when they were needed.

Actions

Immediate Actions

Upon the tripping of both recirculation pumps, the surveillance was immediately stopped and plant was scrammed in accordance with abnormal operating procedures.

Corrective Actions

The surveillance procedure was changed to jumper parallel contacts

on a more accessible relay.

Prior to reactor startup, the reactor feedwater minimum flow valves and controls were verified to function as designed. Data taken revealed that the response time of the minimum flow valve controller is slower than required. The slower response time may cause a trip of the reactor feedwater pump, but it will be in a condition when the pump is not needed, i.e., low flow conditions. Therefore, no immediate action was necessary until the potential changes were evaluated.

Preventive Actions

The plant has an existing project to improve plant labeling. Quality Services personnel had identified labeling concerns with C32 during the last refueling outage. The priority on improving the labeling of C32 will be increased. Furthermore, no non-emergency jumpers will be applied to similar relays in C32, C33, C30, C39, C15 or C17 until the back of the relays are properly labeled.

Potential changes to the minimum flow control process were evaluated on a bench simulation of the valve controls following reactor startup. The evaluation identified several improvements. During an outage on December 7, 1996, both reactor feedwater pump minimum flow controls were modified and tested. In addition, a zero shift was corrected on the #11 reactor feedwater pump positioner.

Failed Component Identification - None

Similar Events

LER 87-008 involved an Engineered Safeguards Feature actuation associated with labeling problems with terminal strips. The existing program to improve plant labeling has addressed terminal strip labeling. All relays similar to the type jumpered in the 96-011 event have always been labeled, but not all the relays were labeled on the back where jumpers are applied.

Figure "Top View of Relay Cabinet in the Cable Spreading Room" omitted.

Northern States Power Company

NSP

Monticello Nuclear Generating Plant

2807 West Hwy 75

Monticello, Minnesota 55362-9637

December 12, 1996 10 CFR Part 50

Section 50.73

US Nuclear Regulatory Commission

Attn: Document Control Desk

Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT

Docket No. 50-263 License No. DPR-22

LER 96-011

Jumper Placement Error During Surveillance Procedure Causes

Dual Recirc Pump Trip, Requiring a Manual Scram

The Licensee Event Report for this occurrence is attached. This report contains one new NRC commitment:

No non-emergency jumpers will be applied to similar relays in C32, C33, C30, C39, C15 or C17 until the back of the relays are properly labeled.

Please contact Tom Parker at (612) 295-1014 if you require further information.

William J Hill

Plant Manager

Monticello Nuclear Generating Plant

c: Regional Administrator - III NRC

Sr Resident Inspector, NRC

NRR Project Manager, NRC

State of Minnesota, Attn: Kris Sanda

Attachment

*** END OF DOCUMENT ***